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A Comparative Study Between 0.3% Topical Nifedipine Ointment and Lateral Internal Sphincterotomy in the Treatment of Chronic Anal Fissure at a Tertiary Care Centre

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Abstract: ***Background**: Chronic anal fissure is a frequently encountered and painful anorectal condition characterized by a tear in the anoderm distal to the dentate line.[1] The condition is perpetuated by a cycle of pain, internal anal sphincter spasm, and reduced blood flow to the affected region. Management aims to interrupt this cycle through either pharmacological or surgical reduction of sphincter tone. While lateral internal sphincterotomy remains the gold standard surgical treatment, topical calcium channel blockers such as nifedipine have emerged as effective conservative alternatives.[2] **Objectives**: To evaluate and compare the effectiveness of topical 0.3% nifedipine ointment with lateral internal sphincterotomy in patients with chronic anal fissure and to assess the complications associated with both treatment modalities. **Methods**: A comparative cross-sectional study was conducted at the Department of General Surgery, Akash Institute of Medical Sciences and Research Centre, Bengaluru, from March 2024 to September 2025. A total of 94 patients aged between 18 and 60 years diagnosed with chronic anal fissure were included. Participants were divided into two groups: Group I (47 patients) received topical 0.3% nifedipine ointment for six weeks, while Group II (47 patients) underwent lateral internal sphincterotomy. Patients were followed at 2, 4, and 6 weeks to assess healing and symptom relief. Statistical analysis was performed using SPSS software, and a p-value <0.05 was considered statistically significant. **Results**: Both treatment groups demonstrated progressive healing over the follow-up period. However, patients treated with lateral internal sphincterotomy showed significantly higher healing rates at all follow-up intervals compared to the nifedipine group ($p < 0.05$). The mean healing rate at 6 weeks was 93.4% in the nifedipine group and 96.0% in the sphincterotomy group. Topical nifedipine therapy was associated with minimal adverse effects including headache (8.5%), flushing (2.1%), and perianal dermatitis (4.3%). In contrast, the surgical group experienced complications such as anal irritation (6.4%) and flatus incontinence (10.6%). **Conclusion**: Lateral internal sphincterotomy provides faster and more complete healing in chronic anal fissure compared with topical nifedipine therapy. However, topical nifedipine remains an effective and well-tolerated non-surgical alternative with fewer complications. Treatment selection should therefore be individualized based on patient preference, clinical presentation, and potential risk of postoperative complications.*

Keywords: Chronic anal fissure, topical nifedipine, lateral internal sphincterotomy, chemical sphincterotomy, anal fissure management

1. Introduction

Anal fissure is defined as a longitudinal tear in the anoderm distal to the dentate line and represents one of the most common causes of severe anal pain encountered in clinical practice. The condition frequently arises following trauma to the anal canal, typically due to the passage of hard stool or episodes of prolonged diarrhea. Persistent sphincter spasm and reduced local blood supply contribute to impaired healing and progression to chronic fissure.[3]

The pathophysiology of chronic anal fissure is primarily attributed to increased resting pressure of the internal anal sphincter. This leads to reduced perfusion of the posterior midline of the anal canal, creating a vicious cycle of pain, sphincter spasm, and ischemia that delays wound healing.[4]

Management strategies are directed toward breaking this cycle. Conservative treatment includes dietary modification, stool softeners, sitz bath, and topical medications that promote sphincter relaxation. Calcium channel blockers such as nifedipine have gained popularity because of their ability to reduce sphincter tone and improve local blood flow.[5]

Surgical intervention is considered in cases where medical therapy fails or when fissures become chronic. Lateral internal sphincterotomy (LIS) remains the gold standard surgical treatment with high healing rates. However, concerns regarding postoperative complications, particularly minor fecal incontinence, have prompted continued interest in effective medical therapies.[6]

The present study was conducted to compare the clinical outcomes of topical nifedipine therapy and lateral internal sphincterotomy in the treatment of chronic anal fissure.[7]

2. Methods

Study Design
Comparative cross-sectional study.

Study Setting
Department of General Surgery, Akash Institute of Medical Sciences and Research Centre, Bengaluru, Karnataka.

Study Duration
March 2024 – September 2025 (18 months)

Study Population
A total of 94 patients diagnosed with chronic anal fissure were included in the study.

Inclusion Criteria
- Patients aged between 18 and 60 years
- Diagnosed with chronic anal fissure
- Willing to provide written informed consent for study

Exclusion Criteria
- Acute anal fissure
- Hemorrhoids or anorectal abscess
- Anal malignancy
- Immunocompromised patients
- Previous anal surgery
- Bleeding disorders
- Pregnancy

Study Groups

Group I
47 patients treated with **topical 0.3% nifedipine ointment**, applied twice daily for 6 weeks.

Group II
47 patients treated with **lateral internal sphincterotomy** performed under standard operative protocols.

All patients were advised high-fiber diet, laxatives, and sitz bath during treatment.

Follow-Up
Patients were reviewed at **2 weeks, 4 weeks, and 6 weeks** to evaluate symptomatic relief from:
- Pain during defecation
- Bleeding per rectum
- Constipation
- Itching

Statistical Analysis
Data were analyzed using **SPSS software**.
Continuous variables were expressed as mean ± standard deviation and categorical variables as percentages.
The **Kruskal–Wallis test** was used for non-parametric comparisons.
A **p-value <0.05** was considered statistically significant.

3. Results

A total of **94 patients** were included in the study, with **47 patients in each treatment group**.

Age Distribution
The majority of patients belonged to the **28–37 years age group (47.8%)**.

Gender Distribution
- Females: **60.6%**
- Males: **39.4%**

Clinical Presentation

Symptom	Percentage
Pain during defecation	90.4%
Constipation	77.6%
Bleeding per rectum	69.1%
Itching	57.4%

Digital Rectal Examination Findings

Finding	Percentage
Chronic non-healing ulcer	65.9%
Sentinel pile	69.1%
Hypertrophied anal papilla	42.5%
Sphincter spasm	94.6%

Site of Fissure

Site	Percentage
Posterior midline	75.50%
Anterior midline	11.70%
Both sites	12.70%

Healing Rates

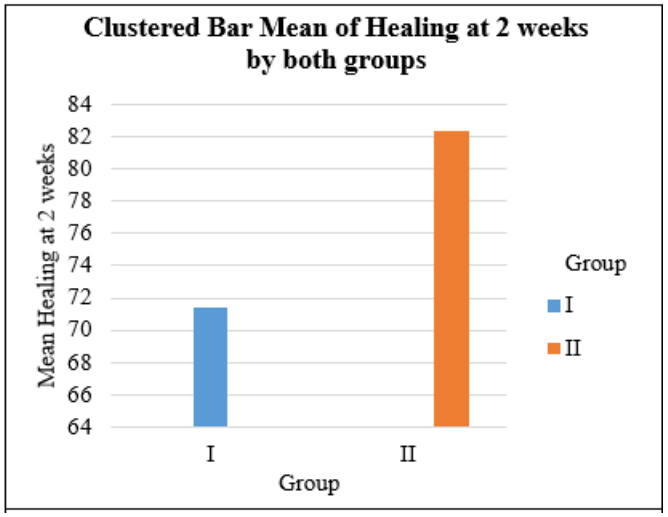
Follow-Up	Nifedipine Group	LIS Group
2 weeks	71.30%	82.30%
4 weeks	86.20%	90.20%
6 weeks	93.40%	96.00%

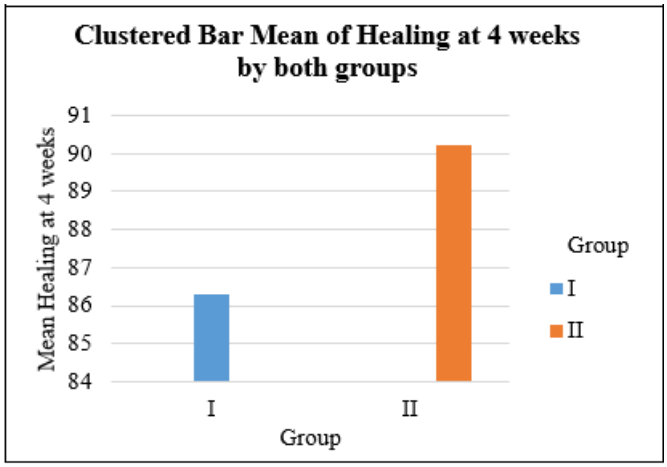
Healing rates were significantly higher in the sphincterotomy group (**p < 0.05**).

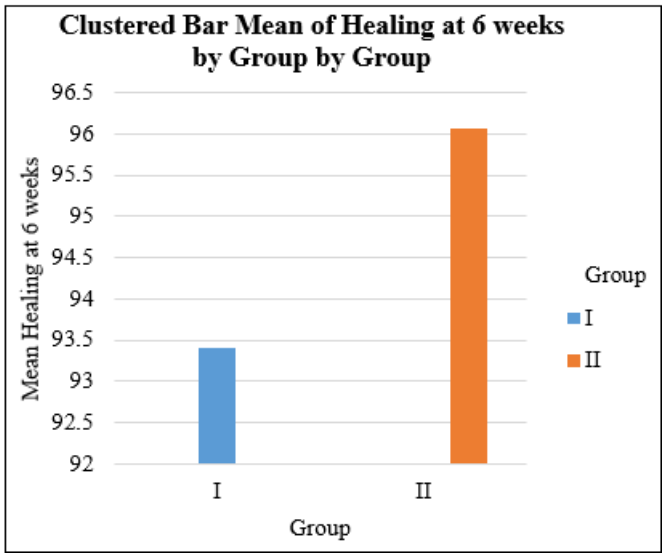
Complications

Nifedipine Group
- Headache – 8.5%
- Perianal dermatitis – 4.3%
- Flushing – 2.1%

LIS Group
- Anal irritation – 6.4%
- Flatus incontinence – 10.6%







4. Discussion

The present study compared topical nifedipine therapy with lateral internal sphincterotomy in patients with chronic anal fissure. Both treatment modalities demonstrated progressive improvement in fissure healing over time.

However, lateral internal sphincterotomy consistently produced higher healing rates at each follow-up interval. These findings are consistent with previous studies that have established LIS as the most effective treatment for chronic anal fissure.

Topical nifedipine acts by relaxing the internal anal sphincter and improving blood flow to the anoderm, thereby promoting healing. Although the healing rate was slightly lower compared with surgical treatment, nifedipine therapy was associated with fewer adverse effects and better patient tolerability.

5. Conclusion

Both topical nifedipine therapy and lateral internal sphincterotomy were effective in treating chronic anal fissure. Lateral internal sphincterotomy demonstrated superior healing outcomes but was associated with a higher incidence of postoperative complications. Topical nifedipine provides a safe and effective non-invasive alternative with fewer side effects. Treatment should therefore be individualized based on patient preference, symptom severity, and risk of complications.

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